The Influence of Non - Governmental Organizations on Main Determinants of the Open Systems Model with Application of the Correlation Analysis Method

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THE INFLUENCE OF NON – GOVERNMENTAL ORGANIZATIONS ON MAIN DETERMINANTS OF THE OPEN SYSTEMS MODEL WITH APPLICATION OF THE CORRELATION ANALYSIS METHOD

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ABSTRACT

The paper aims at analyzing the nature of relations between Non – Governmental Organizations and International Corporations. In first instance the study concentrates on identifying the key determinants of NGO's behaviors. The following section is a description of business environment of International Companies based on H. Deresky's Open Systems Model. Three levels of interrelations have been mentioned, including the Operating Environment, the Host – Country Environment and the Global Environment. The basic assumption is that some of the factors influencing the decisions of NGOs can also influence the strategic and operational decisions of International Companies, as well as their development potential. On the other hand, this relation can also be observed in the opposite direction, where the factors influencing the business environment of the companies can also have some effect on important political and economic decisions of their home or host country governments. Different areas in which the discussed players can carry weight on private business organizations are being discerned in this paper. The solution proposal provides an analysis of influence of determinants of NGO's behaviours on determinants of business environment of International Corporations with use of correlation analysis method.

Key Words: *International Management, Geopolitical Organisms, Non – Governmental Organizations, Correlation Analysis*

INTRODUCTION

In a global World the role of Non – Governmental Organizations (NGOs) grows continuously. In past decades this type of organizations became an important player on the geopolitical scene. Strong popularity of some NGOs forced other geopolitical players such as National States, Intergovernmental Organizations and International Corporations to treat them as a regular and equal partner when planning their strategic decisions. The economic reality shows numerous examples, when actions of International Companies had to be changed because of opposition from NGOs' side. Such a situation creates the need to search for areas where both organisms can reciprocally influence themselves. An elaboration of a model of such interrelations would allow a smoother strategic planning of the development of International Corporations. The present paper aims at analyzing the impact of Non – Governmental Organizations behaviours on those of International Corporations. To achieve this goal the authors propose to first take a look on the determinants influencing the actions of both organisms. Fig. 1 below shows a brief scheme of such a relation.

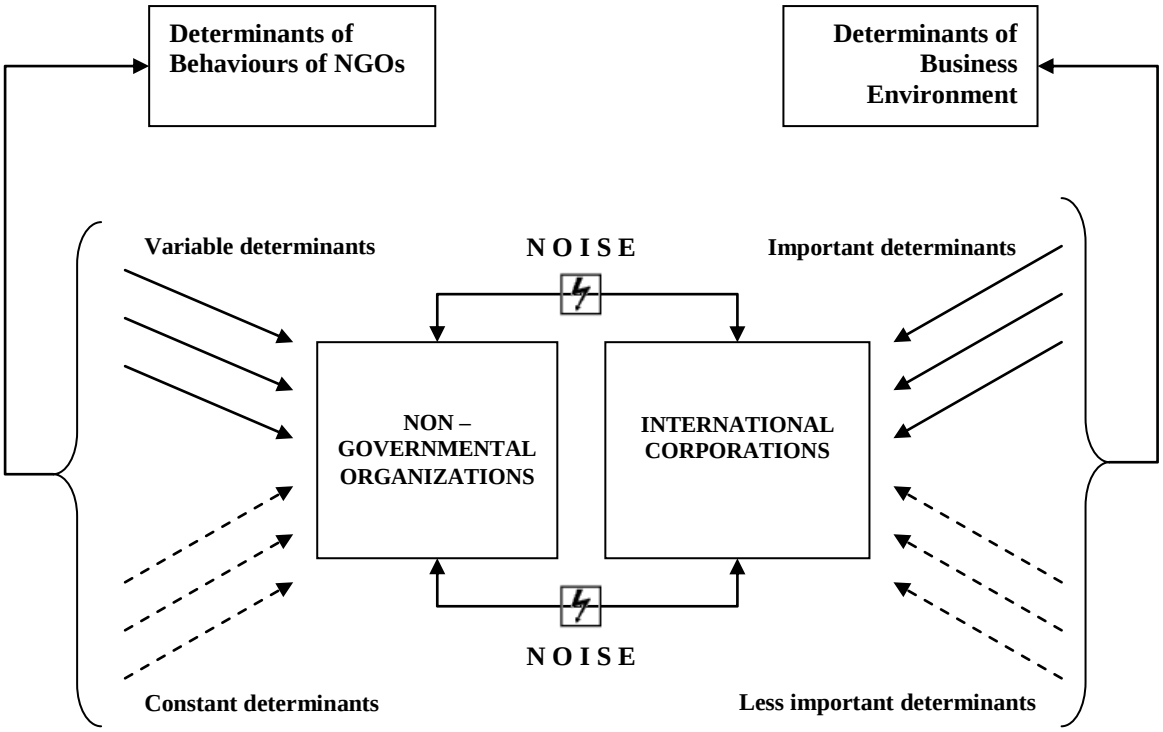

Fig. 1 Non – Governmental Organizations Vs International Corporations
Source: own study

1. DETERMINANTS OF NON – GOVERNMENTAL ORGANIZATIONS BEHAVIORS

Variable determinants of NGO behaviours are those that in short- or medium – term can be subject to external influences. The meaning and relevance of presented factors will be evaluated by expert rankings in further parts of the paper. To this group belong the following:

- Organizational Goals – the most important determinant of NGO behaviours. The formulation of goals of a given NGO will be crucial for other factors influencing its regular operations. Organizational goals draw a profile of future volunteer – workers, financing sources, action profiles and territorial engagement.
- Financing sources – the main assumption for NGO's credibility is its independence, which can be only achieved by transparent and differentiated sources of financing. Nevertheless the financing methods can change with different actions performed by NGOs and that is the reason for which the authors decided to include this factor into variable determinants of NGOs' behaviours.
- Area of operation – factor determining the extent of NGO's operational ability and at the same time the span of its zone of influence. NGOs can act locally or globally, depending on the formulation of their goals. Global NGOs often use the tactic of global goal formulation with local method application. Such an approach on one hand realises a wider strategy, but on the other helps adapting to the local needs.
- People involved – people are at least as much important as finance for NGOs activities. From the definition NGOs are rather multicultural environments, but one has to bear in mind that they will be strongly influenced by cultural roots of people supporting and working for them.
- Ability to Change - NGO's ability to adapt its profile of actions to the changing situation, accordingly to actual needs. The individual level of this determinant indicates NGO's effectiveness through its adaptive skills.

The constant determinants are those which remain unchangeable until an important strategic change in the life of a given NGO occurs. Some of the constant determinants of NGOs' behaviours are the political environment, founding members, knowledge management and others. These factors will not be taken into account in further analysis stages, because they remain stable for the functioning of international corporations in short or medium term.

2. THE BUSINESS ENVIRONMENT OF INTERNATIONAL CORPORATIONS INSIDE THE OPEN SYSTEMS MODEL

The Open Systems Model derives form physics, where an open system signifies a free flow of matter and energy inside and outside the system. In management science it signifies – *per analogiam* – a system that acquires raw materials, capital and qualified staff from outside and – through technology and human abilities transforms them into goods and services. Those are sent back to the macro – environment where they are purchased by the customers. Closed systems are in opposition to open ones. They allow matter in- and outflows but it is not the case of energy. From the economic point of view a closed system is self – efficient and does not come into interactions with its environment.

H. Deresky (2006) proposes the application of this concept for analysis of business environment of International Corporations. Deresky divides it into three groups: Operating Environment, Host – Country Environment and Mega Environment.

The determinants of Operating Environment are the following:

- Legal Regulations – a set of legal acts determining the functioning of mother country companies. Three main types of legal systems can be actually found in the world - European Continental Law (codes and legal acts), Common Law (judicial precedents) and Religious Law (religious books).
- Culture in Organizational Aspect – mainly understood as the influence of local human factor on numerous aspects of organizational behaviours. From the organization's spectrum the cultural factors that bear the most important effect on the functioning of organizations are: the level of orientation towards the results, the ability of strategic planning and the orientation towards a human being.
- Skills – special predispositions and preparation of mother country population towards entrepreneurship, team work, problem solving and adaptation to variable environment. Another group of skills are those areas of industry and economy in which the mother country population shows competitive advantage due to some historical reasons or unique conditions of local natural environment.
- Social Responsibility – the level of awareness of mother country population about the questions from Corporate Social Responsibility area. In general this idea bases on an assumption that an enterprise's managerial board should take into account the needs of all shareholders, not only the major ones, i.e. workers, suppliers, local communities, Non – Governmental Organizations, business partners, investors, individual shareholders or single proprietors.
- Ethics – directly linked with social responsibility. It determines the strength of enrooting of moral rules in mother country society and shows the level of compliance to these ideals in economic praxis. Ethics can be also understood as a general ability of the society to solve the entity of problems that arise with economic development of a country in an ethical way.

The Host – Country Environment Determinants form the following group:

- Economic Factors – general economic system (free market economy, a centrally planned one or a totalitarian system with elements of free market); investment risk in host – country; stability of host – country economy as an indicator of investment attractiveness; stage of economic development (rich developed countries, developing countries or Third World countries); GNP structure; adopted economic and fiscal policies; disproportions in distribution of welfare; model applied for redistribution of fruits of society's work. Although Deresky sees the local competition as a separate determinant the authors decided to include it into the group of Economic Factors as well.
- Political Factors – every enterprise's investment decision has to be preceded by an analysis of host – country political risk. T.W. Shreeve (1984) divides this risk in two types: the macro – political and the micro – political risk and proposes a list of seven possible events from the political risk area: expropriation of enterprise's assets without due and adequate recompense; forced sale of actions to host – country

citizens, usually below their real value; discriminative treatment of foreign companies when applying the rules of law; creation of abroad fund transfer barriers (profits or actions); deprivation of technology or other intellectual property (patents, trademarks, brands); interference in decision making processes; fraud of state authorities and their representatives, including the recalling or changing of former agreements, bribe extortion, etc.

- Technological Factors play a crucial role in modern economy and can be perceived dually – as a general level of host – country technological and scientific advancement (number of host – country international industrial patents) or as the level of host – country's preparation for the reception of modern innovative businesses. This factor's indicators are the number of public and private independent research institutions and think – tanks focused on technological development, the percentage of GNP invested into scientific research and education, existence of national innovation strategy, level of intellectual property protection, incentive programs for creation of research nets, number of international R&D projects, level of compliance of technical and informatics solutions elaborated and applied in host – country with those available in the rest of the World (Ostry, 1998).
- Culture in individual aspect – mainly understood as its influence on communication between individuals. It can be observed in the following areas: varying society organizations (hierarchical, democratic); adopted system of values; individual ways of thinking (depending on the obtained education); varying social roles of citizens; attitudes towards entrepreneurship and other forms of activity; perception of time (circular or linear); role of language and non – verbal communication (including the body language); proxemics – the extent of personal space in both private and professional life; role of touch and cultural context in multicultural communication.
- Subsidiary & Host – Country Interdependence – level of interdependencies between companies investing and operating outside their country of origin and the host – country. Some countries will be encouraging the inflow of Foreign Direct Investment by providing numerous incentives for foreign enterprises interested in entering their internal markets (tax deductions, cheap ground, infrastructure, technology, trained staff), whereas others will be protecting their local businesses by rising market entry barriers for foreign companies (excessive licensing, high customs levels, direct and indirect aid available to competitive local companies, strengthening of national monopolies).

The Mega Environment determinants are:

- Global Trends and Forces – the entity of economical and political phenomena that together with international and global institutions and Intergovernmental Organizations are bearing an indirect, but important influence on strategic decisions of managerial boards of enterprises. The manager's role is to identify and rank a big number of events from this area. The ability of selecting the important ones, a consequent and skilful building of enterprise's international position and lobbying groups becomes today a crucial skill in the field of international management. PR agencies, lobbying groups and some of the NGOs can be very helpful in this field.
- Global Competition – the functioning of international enterprises in global competition does not essentially differ from its substance on a local or regional market. Still two main pillars of the system – consumers and producers do exist. The difference comes with a higher number and scale of competing subjects, new marketing forms and distribution channels, size of logistics operations, diversified access to raw materials and others. All of the above causes automatically a much higher complexity of issues to deal with.
- Multi – National Companies & Host – Country Interdependence – the main difference between this determinant and the Subsidiary & Host – Country Interdependence is the direction of the relation. When at a regional level it was rather the foreign or mother country company that was the beneficiary of potential help from the state, in the actual case it is the host – country that can be strongly dependent on international businesses operating and paying taxes on its territory. Difficulties encountered by global businesses can have strong effects on host – country's economy, in particular on its tax revenues, unemployment rates or accessibility to modern technologies and level of innovation inflow (Deresky, 2006).
- International Law – the multilateral international agreements, the United Nations Universal Declaration of Human Rights, International Court of Justice rulings and laws issued by other international organizations (i.e. EU, WHO, WTO, WIPO, ITU, UNESCO) are forming the body of public and private international law and do strongly influence the global environment of International Companies.
- Level of Global Technological Advancement – available technologies in World's scale. When taking a decision about entering the market and investing in a particular host – country the leaders have to take into

account the relation of host – country's technological advancement and its ability of new innovations creation in comparison to the level of technology available around the World in general. This and preceding factor are not a part of the Open Systems Model, but the authors decided to add them in order to make the picture more complete.

3. SOLUTION PROPOSAL

The subject of analysis consists of four groups of factors. The first group is a set of determinants of Non - Governmental Organizations behaviours described in paragraph above devoted to this matter:

- Group A – variable determinants of Non - Governmental Organizations behaviours

The next three groups belong to Business Environment of International Corporations and have been described above. These are the determinants of International Corporations behaviours in following areas:

- Group B – variable determinants of International Corporations Operating Environment
- Group C – variable determinants of International Corporations Host – Country Environment
- Group D – variable determinants of International Corporations Mega Environment

Each of the groups A, B, C, and D is composed of factors that will be subjects to analysis. The constant determinants of NGO behaviours have been omitted on purpose, as they cannot be influenced in short- or medium – term by any external agents. In effect each of the groups is a 5 element ensemble, where: **A [**$a_1, a_2, \ldots a_5$**], B [**$b_1, b_2, \ldots b_5$**], C [**$c_1, c_2, \ldots c_5$**]** and **D [**$d_1, d_2, \ldots d_5$**]**.

The influence of determinants of Non - Governmental Organizations behaviours on factors influencing the development of International Corporations will be analyzed. Although in longer term the nature of geopolitical processes should be seen as non – linear because of occurring noises and disturbances, in short – term it can be treated as multitude of short linear events. This fact allows the application of several statistical methods, from which the authors decided to choose the correlation analysis. The second assumption is that an indirect analysis of described interactions will be performed because of the condition that the behaviours of International Corporations are being directly influenced only by the determinants of their business environment. In other terms the conclusions about the NGO influence on International Corporations will be drawn from the nature of NGO impact on three groups of determinants of their business environment. This means that the subject of analysis is the influence of group A on groups B, C and D. Further research will be lead in 4 steps and will consist of expert evaluations, homogeneity of variance check, experts' credibility check and check of interrelations occurrence.

Step 1 – Expert Evaluations

For the needs of further analysis same group of independent experts performs an evaluation of significance of each determinant, assuming that the sum of points given by every expert cannot exceed 100. This assumption standardizes the evaluation of experts in relation to a maximal number of one hundred points. In this way sets of evaluations for each group of factors are obtained. Table A shows an example for group A – Non - Governmental Organizations, where $a_1, a_2, \ldots a_5$ stay for its behaviour determinants described above. The presented figures are only a simulation and cannot be treated as real expert statements at this stage of research.

Table 1: Expert significance evaluations for group A – Non - Governmental Organizations

Group A						
Expert	**a_1**	**a_2**	**a_3**	**a_4**	**a_5**	Σ of points
X1	22	10	24	12	9	77
X2	28	21	9	17	19	94
X3	28	7	12	20	23	90
X4	27	10	23	14	19	93
X5	31	15	13	21	17	97

Source: own study

Step 2 – Homogeneity of Variance Check

As a result of statistical calculations Table 1 has been extended into Table 2 (shown below) by addition of average values of expert evaluations, their variances and standard deviations both for each expert and every determinant. These values will be used in further calculations.

Table 2: Expert significance evaluation for group A – Non - Governmental Organizations – extended table

Group A									
Expert	**a_1**	**a_2**	**a_3**	**a_4**	**a_5**	Average	Variance	Stand. Dev.	Σ points
X1	22	10	24	12	9	15,4	49,8	7,06	77
X2	28	21	9	17	19	18,8	47,2	6,87	94
X3	28	7	12	20	23	18	71,5	8,46	90
X4	27	10	23	14	19	18,6	46,3	6,80	93
X5	31	15	13	21	17	19,4	50,8	7,13	97
Average	*27,2*	*12,6*	*16,2*	*16,8*	*17,4*				
Variance	*10,70*	*30,30*	*46,70*	*14,70*	*26,80*			*Average Variance*	*25,84*
Stand. Dev.	*3,27*	*5,50*	*6,83*	*3,83*	*5,18*			*Average Stand. Deviation*	*5,08*

Source: own study

For evaluation of homogeneity of variance the Hartley test will be applied. The use of this tool is possible because the assumption of identical sample sizes of all probes is fulfilled.

It takes the following form: $F_{\max} = \frac{S^2_{\max}}{S^2_{\min}}$, where F_{max} – Hartley statistics value; $S^2_{\max}$ - maximal probe variance value; $S^2_{\min}$ - minimal probe variance value.

If $F_{max} \leq f_{max}$ (value taken from statistical tables), there is no reason for elimination of hypothesis about homogeneity of variance.

Calculations example 1: Variance Significance Check - Hartley test for group A

$f_{\max}(0,05;4;4) = 20,6$, where α = 0,05 – significance level, k = 4 number of degrees of freedom for $S^2_{\max}$, v = 4 number of degrees of freedom for $S^2_{\min}$ (Zielinski, 1972).

Conclusion: as for group A F_{max} = 4,36 ➔ $F_{max} \leq f_{max}$, also there is no reason for abolishing the hypothesis about homogeneity of variance, variances in group A are homogeneous.

Same reasoning has been applied for groups B, C and D, which resulted in obtaining similar tables for International Corporations Operating, Host – Country and Mega Environment. As this paper is only a presentation of the method, other tables have not been entirely included because of their similarity. Table 3 below shows average, variance, standard deviation and F_{max} values for groups B, C and D.

Table 3: Important statistical magnitudes for groups B, C, D.

Group B						Group C					Group D				
Average	*12,8*	*16,6*	*16,8*	*20,4*	*22,4*	*21*	*17,6*	*16,6*	*19,2*	*22,2*	*19,2*	*16,8*	*20,6*	*14*	*19*
Variance	*16,2*	*60,3*	*34,2*	*41,8*	*24,8*	*32,5*	*13,8*	*21,3*	*8*	*12,7*	*48,2*	*66,2*	*55*	*72,5*	*68,5*
Stand. Dev.	*4,02*	*7,77*	*5,85*	*6,47*	*4,98*	*5,7*	*3,71*	*4,62*	*2,83*	*3,56*	*6,94*	*8,14*	*7,42*	*8,51*	*8,28*
F_{max} = 3,72						**Fmax = 4,06**					**Fmax = 1,50**				

Source: own study

It can be easily seen that variances from groups B, C and D are homogenous as well, which allows the authors to proceed to the next step.

Step 3 – Experts credibility check

The checking of credibility of experts will be performed by testing the reciprocal influence of their evaluations in different groups.

Hypothesis: no correlation between evaluations of a given expert for groups A and B exists (A & C and A & D *per analogiam*).

Assumption: the correlation test of determinant evaluations is performed for each expert separately. The relations between evaluations proposed by different experts are not taken into account.

The Student test type *t* will be used for this purpose. It takes the following form: $t_{iAK} = \frac{\left|\overline{X_{iA}} - \overline{X_{iK}}\right|}{S_i \sqrt{\frac{1}{n} + \frac{1}{m}}}$,

where X_i = Expert$_i$, $I = \{1 \ldots 5\}$; $n = 5$, $m = 5$; $K = \{B \vee C \vee D\}$ – actually analyzed group of determinants.

$S_i^2 = \left(S_{iA}^2 + S_{iK}^2\right)$ - summary variance ; $S_i = \sqrt{S_i^2}$ - standard deviation for average expert ratings in groups A and K.

Calculations example 2: Check of correlation of evaluations of Expert 1 for groups A and B

$S_1 = \sqrt{\left(49{,}8 + 46{,}8\right)} = 9{,}83$

Value of statistic *t* for the evaluations of Expert 1 in groups A and B:

$t_{1AB} = \frac{\left|15{,}4 - 19{,}4\right|}{9{,}83\sqrt{\frac{1}{5} + \frac{1}{5}}} = \frac{4}{9{,}83 \cdot 0{,}63} = 0{,}64$ ➔ comparison with critical *t* parameter value taken from statistical tables, for (n+m-2) = 8 number of degrees of freedom, at $\alpha = 0{,}05$ significance level.

Conclusion: as $t_{1AB} = 0{,}64$ and $t_{(0{,}05;8)} = 2{,}306$ ➔ $t_{1AB} < t_{(0{,}05;8)}$, also there is no reason for abolishing the hypothesis about lack of correlation between evaluations of expert 1 for groups A and B. This means that when evaluating one of two groups of determinants, expert 1 is not being suggested by his evaluations of the second group. His evaluations can be then judged as objective.

Same reasoning has been performed for all the experts and all of them have been proven as reliable.

Step 4 – Check of Interrelations Occurrence Between Groups A and B

Hypothesis: There is no correlation between average evaluation of all experts for a given determinant from group A and average evaluation of all experts for a given determinant from group B (groups C and D *per analogiam*).

Assumption: the correlation of average evaluations for each pair of determinants is being performed separately.

The Student test type *t* will be used for this purpose. Here it takes the following form: $t_{ijAK} = \frac{\left|\overline{a_i} - \overline{k_j}\right|}{S_{ij}\sqrt{\frac{1}{n} + \frac{1}{m}}}$, where

a_i – A group determinant subject to analysis; k_j – B, C or D group determinant subject to analysis; $i,j = \{1 \ldots 5\}$ – amount of experts; $n = 5$, $m = 5$; $K = \{B \vee C \vee D\}$ – actually analyzed group of determinants.

$S_{ij}^2 = \left(S_{ai}^2 + S_{kj}^2\right)$ - summary variance; $S_{ij} = \sqrt{S_{ij}^2}$ - standard deviation for average evaluation of determinant a_1 and b_1

Calculations example 3: Check of correlation of evaluations of determinants a_1, b_1 for groups A and B:

$S_{11} = \sqrt{\left(10{,}7 + 16{,}2\right)} = 5{,}19$

Value of statistic *t* for average evaluations of determinants a_1 and b_1

$$t_{11\,AB} = \frac{|27,2 - 12,8|}{5,19\sqrt{\frac{1}{5} + \frac{1}{5}}} = \frac{14,4}{5,19 \cdot 0,63} = 4,39$$ ➔ comparison with critical *t* parameter value taken from statistical tables, for (n+m-2) = 8 number of degrees of freedom, at α = 0,05 significance level.

Conclusion: as $t_{11AB} = 4,39$ and $t_{(0,05;8)} = 2,306$ ➔ $t_{11AB} \geq t_{(0,05;8)}$. The test is significant, which means that there is evidence for abolishment of hypothesis saying that there is no correlation between average evaluation of all experts for a given determinant from group A and average evaluation of all experts for a given determinant from group B. In fact such a correlation does exist, which proves that a situation when a determinant from group A influences a determinant from group B is possible.

Same reasoning should be made for all pairs of determinants from groups A & B. Due to a high number of tests to perform and complexity of calculations this part of research will be made in future with use of more advanced statistical tools. The authors want to stress that all of the above is a method presentation only with simulative data and should be read as such. All mathematical values have been approximated to hundredth parts. All statistical equations and calculations have been performed on basis of information published in (Zielinski, 1972).

CONCLUDING REMARKS

Basing on the above the authors believe that the proposed method of correlation analysis can be applied for research of interrelations between determinants of Non - Governmental Organisations and factors influencing strategic decisions of International Companies. Because of available statistical values this method seems to be a more relevant and promising tool for scientific analysis of interrelations than a simple query with expert opinions without further elaboration. Nevertheless a higher number of experts involved would raise the evaluations credibility. The authors think that further research should be concentrated on the direction and nature of discovered interrelations and the development of methods presented in the present paper.

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